

ABSTRACT OF THE DISCLOSURE

A network apparatus establishes complete crossbar connection for N basic elements each having the capability to function as one computer. A switch device group having N switch devices is connected to each basic element. Each switch device group is composed of a first switch device that is connected directly to a basic element, a second switch device that is connected to the first switch device, a third switch device that is

connected to the second switch device, and so on to a final Nth switch device that is connected to an (N-1)th switch device. The network apparatus includes N loop lines, each loop line connecting one switch device in each switch device group in a loop without duplication.

If an nth switch device is denoted by the number n (where $1 \leq n \leq N$), the loop lines are configured such that the switch device numbers increase one by one with progression around the loop line in either a clockwise or counterclockwise direction and such that the switch

device having switch device number N is connected to the switch device having switch device number 1; the switch devices of each switch device group thus being connected in loops. A basic element and a first switch device are bidirectionally connected for input and output of data,

and each of the switch devices that make up a switch device group are unidirectionally connected for

